



Weather as an effective predictor for occurrence of dengue fever in Taiwan

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Abstract:

We evaluated the impacts of weather variability on the occurrence of dengue fever in a major metropolitan city, Kaohsiung, in southern Taiwan using time-series analysis. Autoregressive integrated moving average (ARIMA) models showed that the incidence of dengue fever was negatively associated with monthly temperature deviation (β Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) -0.126 , p Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.044), and a reverse association was also found with relative humidity (β Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) -0.025 , p Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.048). Both factors were observed to present their most prominent effects at a time lag of 2 months. Meanwhile, vector density record, a conventional approach often applied as a predictor for outbreak, did not appear to be a good one for diseases occurrence. Weather variability was identified as a meaningful and significant indicator for the increasing occurrence of dengue fever in this study, and it might be feasible to be adopted for predicting the influences of rising average temperature on the occurrence of infectious diseases of such kind at a city level. Further studies should take into account variations of socio-ecological changes and disease transmission patterns to better propose the increasing risk for infectious disease outbreak by applying the conveniently accumulated information of weather variability.

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Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Meteorological Factors, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature:



resource focuses on specific type of geography

Urban, Other Geographical Feature

Other Geographical Feature : subtropical

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Taiwan

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Dengue

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Short-Term (

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content